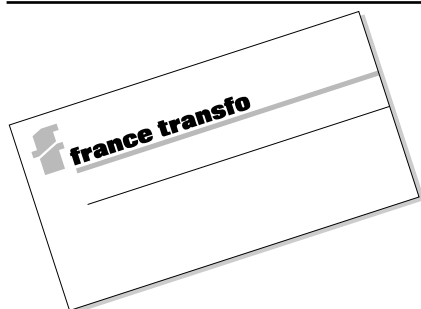


# HV/LV distribution transformers

ground mounted immersed transformers  
from 100 to 3150 kVA - insulation  $\leq$  24 kV / 400 V  
IEC standards



## standards

These transformers comply with the following standards:

- IEC standards;
- French standard NFC 52 100 (1990);
- CENELEC harmonization document HD 398-1 to 398-5.

France Transfo guarantees that its transformers are assembled using components that are both new and PCB-free (< 2 ppm level), in strict compliance with the current standards.



## electrical characteristics

rated power (kVA) <sup>(1)</sup>		100	160	250	315*	400	500*	630	800	1000	1250	1600	2000	2500	3150	
rated voltage	primary <sup>(1)</sup>	15 or 20 kV														
	secondary at no-load <sup>(1)</sup>	400 V between phases, 231 V phase to neutral														
rated insulation level <sup>(3)</sup>	primary	17.5 kV for 15 kV, 24 kV for 20 kV														
HV tapping range (off voltage)		$\pm 2.5\%$ or $\pm 5\%$ or $\pm 2.5\% \pm 5\%$ <sup>(1)</sup>														
vector group		Dyn 11 <sup>(1)</sup> (delta ; star neutral brought-out)														
losses (W)	no-load	210	460	650	800	930	1100	1300	1220	1470	1800	2300	2750	3350	4380	
	load <sup>(2)</sup>	2150	2350	3250	3900	4600	5500	6500	10700	13000	16000	20000	25500	32000	33000	
rated impedance voltage (%) <sup>(2)</sup>		4	4	4	4	4	4	4	6	6	6	6	6	6	7	
no load current (%)		2.5	2.3	2.1	2	1.9	1.9	1.8	2.5	2.4	2.2	2	1.9	1.8	1.7	
voltage drop at full load (%)	P.F. = 1	2.21	1.54	1.37	1.31	1.22	1.17	1.11	1.51	1.47	1.45	1.42	1.45	1.45	1.29	
	P.F. = 0.8	3.75	3.43	3.33	3.30	3.25	3.22	3.17	4.65	4.63	4.62	4.60	4.61	4.62	5.11	
efficiencies (%)	load 100%	P.F. = 1	97.69	98.27	98.46	98.53	98.64	98.70	98.78	98.53	98.57	98.60	98.63	98.61	98.61	98.83
	load 100%	P.F. = 0.8	97.13	97.85	98.09	98.17	98.30	98.387	98.48	98.17	98.22	98.25	98.29	98.27	98.26	98.54
	load 75%	P.F. = 1	98.14	98.54	98.70	98.75	98.84	98.89	98.96	98.81	98.84	98.86	98.88	98.87	98.87	99.04
	load 75%	P.F. = 0.8	97.69	98.18	98.37	98.44	98.56	98.62	98.71	98.51	98.56	98.58	98.61	98.60	98.60	98.80
noise level dB(A)	acoustic power L <sub>WA</sub>	53	59	62	64	65	67	67	68	68	70	71	72	74	74	
	acoustic pressure L <sub>PA</sub> at 0.3m	42	48	50	52	53	54	54	55	55	56	58	58	59	59	

\* non standard ratings available on request.

(1) others upon request, consult us.

(2) load losses and rated impedance voltage, at 75°C.

(3) reminder of insulation levels :

insulation level (kV)	7,2	12	17,5	24
kV r.m.s. 50 Hz - 1 mn	20	28	38	50
kV B.I.L. 1.2/50 $\mu$ s	60	75	95	125

(4) breathing type transformer with conservator upon request, consult us.

## description

- three-phase transformers, for indoor or outdoor use (installation to be specified);
- step-down type <sup>(1)</sup>;
- rated frequency : 50 Hz <sup>(1)</sup>;
- maximum ambient temperature : 40°C <sup>(1)</sup>;
- mineral oil immersed <sup>(1)</sup>;
- hermetically sealed with integral filling <sup>(4)</sup>;
- cover bolted on tank;
- ONAN type natural cooling;
- standard anti-corrosion surface treatment and coating <sup>(1)</sup>;
- final colour grey RAL 7033 <sup>(1)</sup>.

## basic fittings

- 1 off-circuit tappings switch with padlocking located on the cover; this switch operates on the highest rated voltage to bring the transformer to the supply voltage-actual value;
- 3 fixed plug-in connectors 250 A / 24 kV - HV side;
- 4 LV flat-bars, from 250 kVA only; for 100 and 160 kVA: 4 LV porcelain bushings;

- 2 earthing terminals on the cover;
- 4 bi-directional flat rollers from 160 kVA;
- 1 draining device;
- 2 lifting and unloading lugs;
- 1 rating plate to be fixed on 1 of the 4 sides;
- 1 filling plug;
- protection index IP 00.

## options

- The following fittings may be provided :
- 3 HV mobile plug-in connectors 250 A / 24 kV, straight or elbow (the cable characteristics should always be specified);
  - 3 HV porcelain bushings;
  - 4 LV porcelain bushings from 250 kVA;
  - locking device (lock not supplied) for plug-in connectors;
  - LV air-insulated terminal cover to be sealed (possible only with plug-in connectors on HV side and flat-bars on LV side);
  - protection relay, thermometer, thermostat, etc.

For other option, please consult us.

Merlin Gerin

Modicon

Square D

Telemecanique

# HV/LV distribution transformers

## ground mounted immersed transformers

### from 100 to 3150 kVA - insulation ≤ 24 kV / 400 V

#### IEC standards



## dimensions and weights

Typical dimensions and weights are indicated in the table below for mineral oil immersed transformers.

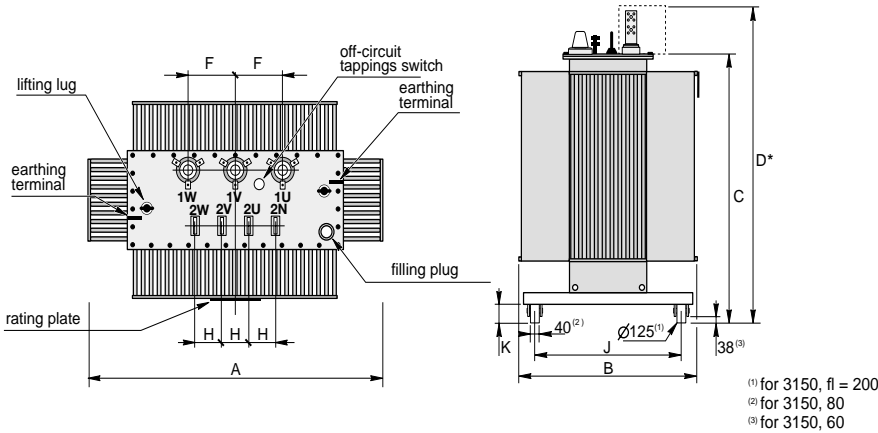
They are provided for 20kV / 400 V transformers with electrical characteristics, as described in the previous table.

For other electrical characteristics (voltage, losses, etc...) or other dielectric, dimensions and weights would be different, please, consult us.

### N. B.

The terminal marking is in accordance with IEC standards 616 (1978), see attached diagram.

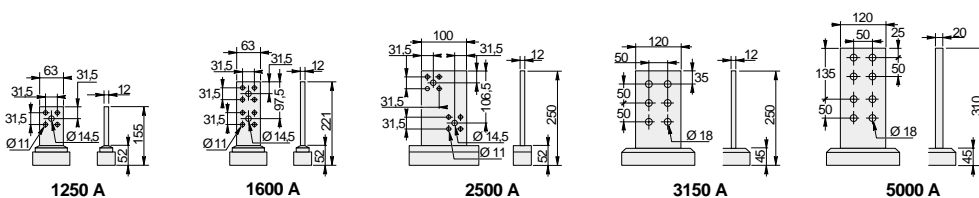
**D\*** : height over LV protection cover ; assembly possible only if the HV is fitted with plug-in connectors.



### dimensions (mm)

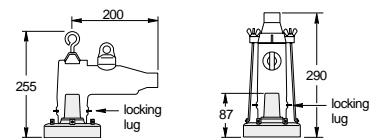
kVA	100	160	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
<b>A</b>	1000	1100	1160	1295	1315	1495	1510	1695	1810	1850	1930	2160	2550	2700
<b>B</b>	700	710	860	895	915	925	940	975	975	1000	1220	1250	1830	1840
<b>C</b>	900	965	1010	1060	1150	1215	1225	1395	1495	1555	1575	1685	1690	1795
<b>D*</b>	1250	1315	1360	1410	1500	1565	1575	1745	1905	1965	1985	2195	2200	2305
<b>F</b>	265	265	265	265	265	265	265	265	265	265	265	265	265	265
<b>H</b>	75	75	150	150	150	150	150	150	150	170	170	170	170	170
<b>J</b>	520	520	520	670	670	670	670	670	670	820	820	820	820	820
<b>K</b>	105	105	105	105	105	105	105	105	85	85	85	85	85	85
<b>flat-bars</b>	—	—	1250A	1250A	1250A	1250A	1250A	1250A	1600A	2500A	2500A	3150A	5000A	5000A
<b>porcelain LV</b>	250A	250A	630A	630A	630A	1000A	1000A	1600A	1600A	2500A	2500A	3150A	4000A	5300A
<b>weights (kg)</b>														
<b>total</b>	550	700	1000	1165	1350	1545	1740	2100	2390	2850	3500	3880	4640	5730
<b>mineral oil</b>	110	150	215	275	310	350	380	450	580	670	790	870	1130	1230

### LV flat-bars (from 250 kVA only)



LV terminal cover required for external use.

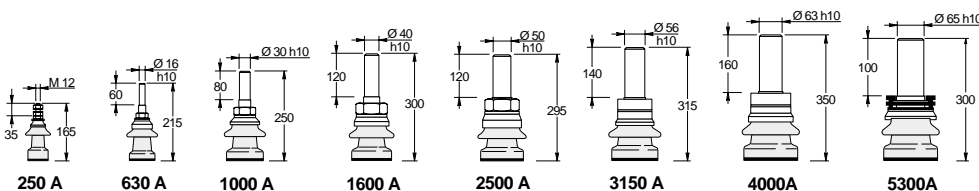
### HV fixed plug-in connectors 250 A - 24 kV



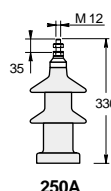
with elbow mobile connector

with straight mobile connector

### LV porcelaine bushings (compulsory for 100 and 160 kVA)



### HV porcelaine bushings



**Nota** : never use HV porcelaine bushings with LV protected by a terminal cover.

Casual arrangements such as bars and cables supports, flexible connectors, etc. are to be provided the contractors in order to avoid mechanical stresses on the transformer flat-bars and bushings.

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Due to the evolution of standards and materials, the present document will bind us only after confirmation from technical department.



## Wind turbines and Vegeta transformers, winds is in the air for ecology

- An interesting solution for incorporation into a pole tower
- Good resistance for overloads and temperature variations
- One of the highest fire points for insulating oil (360°)
- A fully biodegradable liquid dielectric of food processing quality
- A compact design, for maximum logeability and accessibility



## Vegeta, an active approach for the environment



2800 kVA, 20kV/690V transformer